

## RE-SEALING MECHANISM FOR A DISPENSER

### **FIELD OF THE INVENTION**

The present invention relates to a method of dispensing at least one solid dosage form comprising the steps of: opening a resealable container and lid assembly, wherein the container comprises a reservoir for storing solid dosage forms and an opening for dispensing individual solid dosage form; the opening further comprises an elastomeric seal that is at least partially located circumferentially around the opening; the lid comprises a plug that is integrally attached to an inner portion of the lid and the lid consists of a hinge attached to the container that functions to rotate the lid at one pivot point; dispensing at least one solid dosage form from the reservoir of the container and through the opening; applying a sufficient pressure upon an outer portion of the lid so that the plug engages the elastomeric seal of the opening; and maintaining the sufficient pressure by a latch mechanism located on both the container and the lid to form a moisture-tight seal between the plug and the elastomeric seal of the opening.

### **BACKGROUND OF THE INVENTION**

Solid dosage forms are typically used to deliver pharmaceutical, medicated confectionary, and confectionary products. These dosage forms include but are not limited to: compressed tablets, coated tablets, capsules, caplets, liquid gels, liquid encapsulated beads, et al. One example of a solid dosage dispenser is an active dispenser where a user pushes a button or lever and one dosage form exits the container at a time. Diagnostic test strips and solid dosage forms often are moisture sensitive and need to be stored in containers that protect them from ambient moisture that they may be exposed to during both storage and use.

### **SUMMARY OF THE INVENTION**

In one embodiment of the present invention, the method of dispensing at least one solid dosage form comprises the steps of: opening a resealable container and lid assembly, wherein the container comprises a reservoir for storing solid dosage forms and an opening for dispensing individual solid dosage form; the opening further comprises an elastomeric seal that is at least partially located circumferentially around the opening; the lid comprises a plug that is integrally attached to an inner portion of the lid and the lid consists of a hinge attached to the container that functions to rotate the lid at one pivot point; dispensing at least one solid dosage form from the reservoir of the container and through the opening; applying a sufficient pressure upon an outer portion of the lid so that the plug engages the elastomeric seal of the opening; maintaining the sufficient pressure by a latch mechanism located on both the container and the lid to form a moisture-tight seal between the plug and the elastomeric seal of the opening; opening the resealable

container and lid assembly by removing the sufficient pressure; dispensing at least one solid dosage form from the reservoir of the container and through the opening; again applying a sufficient pressure upon an outer portion of the lid so that the plug engages the elastomeric seal of the opening; and maintaining the sufficient pressure by a securing mechanism located on both the container and the lid to form a substantially moisture-tight seal between the plug and the elastomeric seal of the opening.

### **BRIEF DESCRIPTION OF THE DRAWINGS**

The following figures are merely illustrative of the present invention and are not meant to limit the invention to the embodiments shown in the figures.

Figures 1A and 1B illustrates an embodiment of the present invention where Figure 1A is a cut-away view of the lid, foil and opening in the closed position and Figure 1B is a perspective view of the lid, foil and opening in the open position.

Figures 2A and 2B illustrates an embodiment of the present invention where Figure 2A is a cut-away view of the lid and opening in the open position and Figure 2B is a cut-away view of the lid and opening in the closed position.

Figures 3A and 3B illustrates an embodiment of the present invention where Figure 3A is a cut-away view of the lid, foil and opening in the open position and Figure 2B is a cut-away view of the lid, foil and opening in the closed position.

Figures 4A and 4B illustrates an embodiment of the present invention where Figure 4A is a cut-away view of the lid and opening in the open position and Figure 4B is a cut-away view of the lid and opening in the closed position.

Figures 5, 6 and 7 illustrate an embodiment of the present invention where Figures 5 and 6 are perspective views showing the dispenser in the open position and Figure 7 is a cut-away view showing a partial view of the dispenser with the lid and opening in the closed position.

Among those benefits and improvements that have been disclosed, other objects and advantages of this invention will become apparent from the following description taken in conjunction with the accompanying figures. The figures constitute a part of this specification and include illustrative embodiments of the present invention and illustrate various objects and features thereof.

### **DETAILED DESCRIPTION OF THE INVENTION**

Detailed embodiments of the present invention are disclosed herein; however, it is to be understood that the disclosed embodiments are merely illustrative of the invention that may be embodied in various forms. In addition, each of the examples given in connection with the various

embodiments of the invention are intended to be illustrative, and not restrictive. Further, the figures are not necessarily to scale, some features may be exaggerated to show details of particular components. Therefore, specific structural and functional details disclosed herein are not to be interpreted as limiting, but merely as a representative basis for teaching one skilled in the art to variously employ the present invention.

The present invention relates to a dispenser that, in one embodiment, is used in a solid dosage dispenser that presents a single dosage form during shelf life and after each index cycle. In another embodiment, the present invention relates to a dispenser that dispenses diagnostic test strips that are packaged in a substantially moisture tight container. The invention provides a substantially moisture tight environment during shelf life and use life.

In one embodiment, the dispenser consists of multiple pieces. One piece of the dispenser is an element that creates a moisture tight seal at the place where the dosage form exits the dispenser. Another aspect is to protect the seal area from being damaged due to accidental contact with foreign matter.

The present invention comprises a sealing "door" or "plug" to seal and protect the dispensing opening/hole. In one embodiment, the dispensing hole may be an actual hole or a slit within an elastomeric material. For example, the plug can be any shape (e.g. circular, oval, rectangular, square,...). In another example, the "door" or "plug" can include a plugging principle (a "male" to plug the "female") whereby through interference, the opening is sealed and resealed upon opening and closing. In yet another example, the hole can be plugged through interference with the plug by using the same material or can rely upon the use of dissimilar materials (e.g. PP and HDPE, PP and TPE, or others).

In yet another embodiment, the "door" or "plug" applies pressure to an elastomeric gasket on the container that forms and protects the dispensing hole.

In a further embodiment, the present invention uses a foil seal over the top of the "hole". The foil material can be affixed to the material (e.g. PP or PE) that surrounds the gasket material and not onto the gasket material itself.

In another embodiment, the door can be created through a living hinge with the container or can be attached afterwards by using common locking mechanisms. In another example, the door can be engineered to require at least two movements to release it and could provide a mechanism for providing a Child Resistant package. In yet another example, the door can be designed to catch and/or retain the dosage form once it has been dispenser from the container.

In another embodiment, the present invention relates to moisture-tight and resealable mechanism. The term "resealable" means that the container can be opened/reopened and

closed/reclosed a numerous amount of times (e.g. more than 5 times) and still retain its moisture-tight properties. The term "moisture tight" means the moisture ingress of the container was less than about 1000 micrograms/ day of water, determined by the following test method: (a) place approximately one gram of molecular sieve in the container and record the weight; (b) close the resealable mechanism; (c) place the sealed container in an environmental chamber at conditions of 80% relative humidity and 72F; (c) after one day, weigh the container containing the molecular sieve; (d) after approximately two weeks, weigh the container (e) subtract the first day sample from the value obtained and divide by the number of days to calculate the moisture ingress of the container in units of micrograms of water.

Figures 1 through 4 illustrates embodiments of the present invention. Figure 1 shows a dispenser with an enlarged view one embodiment of the sealing mechanism. In the enlarged view, the foil seal 1 is also shown. The door 2 applies pressure to the elastomeric seal 3 of the container when closed to form a moisture-tight seal. Figure 2 shows another embodiment of the sealing mechanism in both the open and closed positions. In the open position, the "door" (e.g. "plug") 2 on the lid 3 allows the seal to be opened. In the closed position, the plug 2 contacts the elastomer 4 on the container and thus, seals the container. In one example, the container comprises a portion, which contacts the plug, composed of an elastomer or like materials. Figure 3 shows yet another embodiment of the sealing mechanism in both the open and closed positions. In the open position, the foil seal 1 is applied to the container (e.g. welded) and the lid 2 does not contact the container. In the closed position, the plug 3 of the lid 2 is applied over the foil seal 1 and the plug 3 creates an interference fit with the container. In one example, the plug and the container are composed of the same material (e.g. PP or PE (Hd/Ld)). Figure 4 shows a further embodiment of the sealing mechanism in both the open and closed positions whereby the plug 3 again creates an interference fit with the container. In one example, the plug 3 and the container are composed of the same material (e.g. PP or PE (Hd/Ld)).

In another embodiment, the sealing mechanism of the present invention is used in a single dispense solid dosage dispenser or a single dispense diagnostic test strip. In a further embodiment, the sealing mechanism of the present invention creates a moisture tight seal that protects the product in the dispenser during its shelf life and use life. In yet another embodiment, the sealing mechanism of the present invention creates a moisture tight seal by the interference of a plug in an opening with the same materials used in the container and lid. In another embodiment, the sealing mechanism of the present invention creates a moisture tight seal by the interference of a plug in an opening with the plug being composed of a different materials then that used in the container and lid. In another embodiment, the sealing mechanism of the present invention uses, in addition to the

plug, a foil seal over the opening. In another embodiment, the sealing mechanism of the present invention creates a moisture tight seal by compressing an elastomer in conjunction with the plug. In another embodiment, the sealing mechanism of the present invention comprises a "door" or "plug" created as one piece so as to be a living hinge or assembled to a dispenser. In another embodiment, the sealing mechanism of the present invention comprises a plug having two distinct movements to release in order to create a Child Resistant package. In another embodiment, the sealing mechanism of the present invention comprises a door or plug that catches the dosage so that it does not need to be touched by the user.

In yet another embodiment, the dispensing hole may be an actual hole or could be a slit within an elastomer material. The hole can be any shape (e.g. circular, oval, rectangular, square,...). In a further embodiment, the "door" can feature a plugging principle (a "male" to plug the female) whereby through interference, the opening is sealed and resealed upon opening and closing. The hole can be plugged through interference using a common material or can rely upon the use of dissimilar materials (e.g. PP and HDPE, PP and TPE, or others). In yet another embodiment, the door applies pressure to an elastomer gasket that forms and protects the dispensing hole. Without the pressure exerted by the door, the elastomeric gasket might not reseal after each use. In the case where a face seal is used, foil can be heat sealed to the opening to provide additional protection during the shelf life storage.

In a further embodiment, the opening that the diagnostic test strips pass through sufficiently opens to allow the individual strip to pass through and then be resealed. For example, Figure 5 shows a hinged door 10 with a plug 11 that creates a seal to the opening 13 when closed. The door 10 can be opened manually or when the indexing mechanism actuates. The internal opening 13 is shown in Figure 6 and Figure 7. In one embodiment, the door 10 is closed manually after the strip 12 has been indexed out, resealing the opening.

Whereas particular embodiments of the present invention have been described above as examples, it will be appreciated that variations of the details may be made without departing from the scope of the invention. One skilled in the art will appreciate that the present invention can be practiced by other than the disclosed embodiments, all of which are presented in this description for purposes of illustration and not of limitation. It is noted that equivalents of the particular embodiments discussed in this description may practice the invention as well. Therefore, reference should be made to the appended claims rather than the foregoing discussion of examples when assessing the scope of the invention in which exclusive rights are claimed.